

# **Advanced ATP Concepts and Design for 10 Gbps LEO-GEO Optcomm Transceiver**

Shinhak Lee and Gerardo G. Ortiz  
Jet Propulsion Laboratory  
California Institute of Technology  
Pasadena, CA 91109

## **ABSTRACT**

Optical communications for LEO-GEO has been proposed and developed over 10 years. Recently, 50 Mbps has been demonstrated by ESA with the RMS pointing error of 0.08urad and 0.85urad of bias. The motivation for the LEO-GEO optical link is the relatively short range, which makes beacon based tracking/pointing scheme ideal due to the fact that there is no atmosphere interfering in the optical path. In light of ESA's success, optical communications for LEO-GEO already proved feasibility. However, there are still many features that would make optical communications more competitive with RF communications such as very low tracking loss, all optical communications, and single beam acquisition and tracking. In this paper, we will present the study results of those advanced concepts.

**Keywords:** Optical communications, Acquisition, tracking, Pointing, LEO-GEO